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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/050,402	01/15/2002	Olobo Jonathan Obaje	21429-12	9054

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Oppenheimer Wolff & Donnelly LLP
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Los Angeles, CA 90067

EXAMINER

LEWIS, PATRICK T

ART UNIT PAPER NUMBER

1623

DATE MAILED: 01/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/050,402

Applicant(s)

OBAJE, OLOBO JONATHAN

Examiner

Patrick T. Lewis

Art Unit

1623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 October 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 8-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-10, 13 and 15-21 is/are rejected.
- 7) ☒ Claim(s) 11, 12, 14, and 22-23 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>09162003</u> . | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

Applicant's Response dated October 21, 2003

1. In the Response filed October 21, 2003, claims 1, 5, 8-14, 17, and 19 were amended; claim 7 was canceled. Applicant presented arguments/remarks directed to the claim for foreign priority; information disclosure statement, objection to the specification; objections to claims 9-12, 14-19, and 21-23; rejection of claims 1-6, 9-16, and 18-23 under 35 U.S.C. 112, second paragraph; rejection of claim 15 under 35 U.S.C. 102(b); and the rejection of claims 1-10, 13, 16, and 18-21 under 35 U.S.C. 103(a). Claims 1-6 and 8-23 are pending. An action on the merits of claims 1-6 and 8-23 is contained herein below.
2. Applicant indicated that a certified copy of the foreign application, SG 200100727-7, has been filed; however, no copy has been received. Thus, the requirement as set forth under 35 U.S.C. 119(b) has not been met.
3. The objection to the specification as set forth in the Office Action dated May 28, 2003 has been rendered moot in view of the amendment dated October 21, 2003.
4. The objection to claims 9-12, 14-19, and 21-23 has been rendered moot in view of the amendment dated October 21, 2003.
5. The rejection of claims 1-6, 9-16, and 18-23 under 35 U.S.C. 112, second paragraph, has been rendered moot in view of the amendment dated October 21, 2003.
6. The rejection of claim 15 under 35 U.S.C. 102(b) is maintained for the reasons of record set forth in the Office Action dated May 28, 2003.

7. The rejection of claims 1-6, 8-10, 13, 16, and 18-21 under 35 U.S.C § 103(a), is maintained for the reasons of record set forth in the Office Action dated May 28, 2003.

Objections/Rejections of Record Set For the in Office Action dated May 28, 2003

8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

9. Claim 15 is rejected under 35 U.S.C. 102(b) as being anticipated by Hasenhuettl U.S. Patent 5,440,027 (Hasenhuettl).

Hasenhuettl discloses a carbohydrate fatty acid produced via a solvent-free transesterification of acylated carbohydrates under reduced pressure, 1 – 500 mm Hg, at a temperature of 95-200° C in the presence of an acid catalyst (column 5, lines 56-68; column 3, lines 34-68; column 4, lines 1-2; column 9, lines 56-68; column 11, lines 2-21).

10. Applicant's arguments filed October 21, 2003 have been fully considered but they are not persuasive.

Applicant argues that the carbohydrate fatty acid of Hasenhuettl is produced by a different method. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

11. Claims 1-6, 8-10, 13, 16, and 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasenhuettl U.S. Patent 5,440,027 (Hasenhuettl) in combination with D-Amato U.S. Patent 3,054,789 (D'Amato), Silver et al. U.S. Patent 5,596,085 (Silver), Matsumoto et al. U.S. Patent 5,008,387 (Matsumoto), and Heesen et al. U.S. Patent 3,951,945 (Heesen).

Claim 1 is drawn to a process for preparing carbohydrate fatty-acid esters comprising: a) reacting acylated carbohydrate with free fatty acid in the presence of an acid catalysts under reduced pressure; b) decolorizing and separating out the unreacted fatty acid from the reaction mixture or step a); c) precipitating out the unreacted acylated carbohydrate from the reaction mixture obtained from step b); and d) recovering carbohydrate fatty ester from the reaction mixture obtained from step c). Claims 2-10, 13, 16, and 18-21 depend from claim 1. Claim 2 is drawn to a process wherein no solvent is added in step a). Claims 3 and 4 limit the manner in which the unreacted fatty acid is removed in step b). Claim 5 limits the temperature range for precipitating the unreacted acylated carbohydrate in step c). Claim 6 is drawn to a process wherein the unreacted fatty acid and acylated carbohydrate is recycled. Claims 7-8 limit the pressure range wherein step a) is carried out. Claims 9-10 are drawn to HLB properties of the products produced. Claim 13 limits the temperature range in which step a) is performed. Claim 16 limits the carbohydrates employed in the process. Claim 18 limits the acid catalyst employed. Claims 19-20 limit the workup solvents. Claim 21 limits the free fatty acids employed.

Hasenhuettl teaches the solvent-free transesterification of acylated carbohydrates under reduced pressure, 1 – 500 mm Hg, at a temperature of 95-200° C in the presence of an acid catalyst, which meets the sulfuric acid of claim 18 (column 5, lines 56-68; column 3, lines 34-68; column 4, lines 1-2; column 9, lines 56-68; column 11, lines 2-21). Saccharides disclosed as starting materials include glucose, sucrose, and raffinose along with other monosaccharides, disaccharides, and higher polysaccharides (column 7, lines 6-20). Suitable free fatty acids used in the process include butyric, lauric, palmitic, stearic, and oleic acids (column 8, lines 65-68; column 9, lines 1-18). Hasenhuettl further teaches that conventional purification techniques may be employed such as neutralization, dissolution into an organic solvent such as hexane, and decolorization with activated charcoal or hydrogen peroxide.

Hasenhuettl exemplifies purification of the products by distillation and filtration but lacks the recitation of separating the unreacted fatty acid and precipitating the unreacted acylated carbohydrate. Hasenhuettl teaches the use of partially acylated carbohydrates; however, Silver employs an identical process using partially or fully acylated carbohydrates (sucrose octaacetate) (columns 5-10).

D'Amato teaches a process preparing pure sucrose fatty esters. D'Amato teaches that after removal of the catalyst and neutralization, the resulting mixture is continuously extracted with an organic solvent capable of dissolving the unreacted fatty acid lower alkyl ester or glyceride and the free fatty acid present in the medium, and in which the fatty acid sucrose ester is insoluble, and having a favorable partition coefficient (column 1, lines 61-72; column 2, lines 1-3).

Heesen teaches a method for purifying fatty acid esters of saccharides. Heesen teaches that non-esterified fatty acid can be removed by reaction with a bivalent cation with formation of insoluble calcium fatty acids salts and subsequent filtration, by treatment with ion exchange resins, by fractionated crystallization or a similar treatment, by (molecular) distillation (column 4, lines 15-21).

Matsumoto teaches a process for purifying sucrose fatty acid esters. Masumoto teaches that the removal of the unreacted sucrose from the reaction mixture containing sucrose fatty acid ester has been generally conducted by utilizing the property that sucrose is slightly soluble in common organic solvents, namely by adding a solvent to the reaction mixture to precipitate the unreacted sucrose and removing the precipitate (column 1, lines 39-45).

It would have been obvious to one of ordinary skill in the art at the time of the invention to prepare carbohydrate fatty-acid esters by a process comprising: a) reacting acylated carbohydrate with free fatty acid in the presence of an acid catalysts under reduced pressure; b) decolorizing and separating out the unreacted fatty acid from the reaction mixture or step a); c) precipitating out the unreacted acylated carbohydrate from the reaction mixture obtained from step b); and d) recovering carbohydrate fatty ester from the reaction mixture obtained from step c) as Hasenhuettl teaches the transesterification reaction and the product is purified using conventional means. The instantly claimed purification techniques are seen to be well within the purview of one of ordinary skill in the art at the time of the invention. The purification steps of the instantly claimed process are based on the solubility properties of the resultant reaction mixture.

The use of solubility properties for purifying carbohydrate fatty acid esters is well known in the art. The choice of the appropriate solvents, pH, temperatures, and concentrations are seen to be well within the purview of the skilled artisan. The skilled artisan would readily recognize that the precipitation of a given compound is generally enhanced by lowering the temperature of the solution in which it is contained. The specific condition manipulated in order to affect the solubility of a given compound is seen to be a choice of experimental design. It would have also been obvious to one of ordinary skill in the art to recycle the unreacted components of the reaction mixture as it is well established that batch and continuous processes are not patentably distinct. The recitation of HLB values of the product produced is not seen to add any patentable weight to the instantly claimed process as all of the process steps for preparing the carbohydrate fatty acid esters are taught in the art. Where the steps of a process are the same as the prior art, and the only difference is in the recital of the product produced, the process is unpatentable over the prior art.

12. Applicant's arguments filed October 21, 2003 have been fully considered but they are not persuasive.

Applicant argues that all the claim limitations are not present in the cited references and one of ordinary skill in the art would have no motivation to modify the cited references into the present invention. Specifically, applicant argues that both Hasenhuettl and Silver disclose methods for preparing saccharide fatty acid polyesters by first conducting an esterification, then conducting trans-alcoholysis or transesterification. Applicant also comments on the unexpected advantages of the

transesterification process disclosed by the prior art; however, these comments are not seen to be germane to the rejections of record, as none of the asserted "advantages" recited as claim limitations.

The examiner disagrees with applicant's characterization of the art of record. Hasenhuettl teaches solvent-free transesterification of acylated carbohydrates under reduced pressure, 1 – 500 mm Hg, at a temperature of 95-200° C in the presence of an acid catalyst (column 5, lines 56-68; column 3, lines 34-68; column 4, lines 1-2; column 9, lines 56-68; column 11, lines 2-21). Applicant's attention is directed to column 3, lines 34-68; column 8, lines 38-67; and column 9, lines 1-32, wherein Hasenhuettl teaches partially esterified saccharide is transesterified with a fatty acid-containing reagent selected from the group consisting of fatty acids, fatty acid salts, lower alkyl esters, and fatty acid anhydrides. The examiner acknowledges that the process of Hasenhuettl employs two steps. In the first step a saccharide is converted into a partially esterified saccharide. In the second step, the partially esterified saccharide is transesterified with a fatty acid-containing reagent. However, the method as instantly claimed does not exclude additional methodological steps. In the absence of some proof of a secondary nature to obviate the rejection as set forth in the Office Action dated May 28, 2003, or of some specific limitations which would tip the scale of patentability in the favor of the instantly claimed invention, it would have been obvious to one of ordinary skill in this art at the time of the invention to prepare carbohydrate fatty-acid esters employing a method comprising: a) reacting acylated carbohydrate with free fatty acid in the presence of an acid catalysts under reduced pressure; b)

decolorizing and separating out the unreacted fatty acid from the reaction mixture or step a); c) precipitating out the unreacted acylated carbohydrate from the reaction mixture obtained from step b); and d) recovering carbohydrate fatty ester from the reaction mixture obtained from step c).

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hasenhuettl U.S. Patent 5,440,027 (Hasenhuettl) in combination with D-Amato U.S. Patent 3,054,789 (D'Amato), Silver et al. U.S. Patent 5,596,085 (Silver), Matsumoto et al. U.S. Patent 5,008,387 (Matsumoto), and Heesen et al. U.S. Patent 3,951,945 (Heesen).

Claim 17 is drawn to a process for preparing carbohydrate fatty-acid esters comprising: a) reacting acylated carbohydrate with free fatty acid in the presence of an acid catalysts under reduced pressure; b) decolorizing and separating out the unreacted fatty acid from the reaction mixture or step a); c) precipitating out the unreacted acylated carbohydrate from the reaction mixture obtained from step b); and d) recovering carbohydrate fatty ester from the reaction mixture obtained from step c), wherein the acyl group in the reactant acylated carbohydrates is acetic or propanoic acyl group.

Hasenhuettl teaches the solvent-free transesterification of acylated carbohydrates under reduced pressure, 1 – 500 mm Hg, at a temperature of 95-200° C in the presence of an acid catalyst, which meets the sulfuric acid of claim 18 (column 5, lines 56-68; column 3, lines 34-68; column 4, lines 1-2; column 9, lines 56-68; column 11, lines 2-21). Saccharides disclosed as starting materials include glucose, sucrose, and raffinose along with other monosaccharides, disaccharides, and higher polysaccharides (column 7, lines 6-20). Suitable free fatty acids used in the process include butyric, lauric, palmitic, stearic, and oleic acids (column 8, lines 65-68; column 9, lines 1-18). Hasenhuettl further teaches that conventional purification techniques may be employed such as neutralization, dissolution into an organic solvent such as hexane, and decolorization with activated charcoal or hydrogen peroxide.

Hasenhuettl exemplifies purification of the products by distillation and filtration but lacks the recitation of separating the unreacted fatty acid and precipitating the unreacted acylated carbohydrate. Hasenhuettl teaches the use of partially acylated

carbohydrates; however, Silver employs an identical process using partially or fully acylated carbohydrates (sucrose octaacetate) (columns 5-10).

D'Amato teaches a process preparing pure sucrose fatty esters. D'Amato teaches that after removal of the catalyst and neutralization, the resulting mixture is continuously extracted with an organic solvent capable of dissolving the unreacted fatty acid lower alkyl ester or glyceride and the free fatty acid present in the medium, and in which the fatty acid sucrose ester is insoluble, and having a favorable partition coefficient (column 1, lines 61-72; column 2, lines 1-3).

Heesen teaches a method for purifying fatty acid esters of saccharides. Heesen teaches that non-esterified fatty acid can be removed by reaction with a bivalent cation with formation of insoluble calcium fatty acids salts and subsequent filtration, by treatment with ion exchange resins, by fractionated crystallization or a similar treatment, by (molecular) distillation (column 4, lines 15-21).

Matsumoto teaches a process for purifying sucrose fatty acid esters. Masumoto teaches that the removal of the unreacted sucrose from the reaction mixture containing sucrose fatty acid ester has been generally conducted by utilizing the property that sucrose is slightly soluble in common organic solvents, namely by adding a solvent to the reaction mixture to precipitate the unreacted sucrose and removing the precipitate (column 1, lines 39-45).

It would have been obvious to one of ordinary skill in the art at the time of the invention to prepare carbohydrate fatty-acid esters by a process comprising: a) reacting acylated carbohydrate with free fatty acid in the presence of an acid catalysts under

reduced pressure; b) decolorizing and separating out the unreacted fatty acid from the reaction mixture or step a); c) precipitating out the unreacted acylated carbohydrate from the reaction mixture obtained from step b); and d) recovering carbohydrate fatty ester from the reaction mixture obtained from step c) as Hasenhuettl teaches the transesterification reaction and the product is purified using conventional means. The instantly claimed purification techniques are seen to be well within the purview of one of ordinary skill in the art at the time of the invention. The purification steps of the instantly claimed process are based on the solubility properties of the resultant reaction mixture. The use of solubility properties for purifying carbohydrate fatty acid esters is well known in the art. The choice of the appropriate solvents, pH, temperatures, and concentrations are seen to be well within the purview of the skilled artisan. The skilled artisan would readily recognize that the precipitation of a given compound is generally enhanced by lowering the temperature of the solution in which it is contained. The specific condition manipulated in order to affect the solubility of a given compound is seen to be a choice of experimental design. It would have also been obvious to one of ordinary skill in the art to recycle the unreacted components of the reaction mixture as it is well established that batch and continuous processes are not patentably distinct. The recitation of HLB values of the product produced is not seen to add any patentable weight to the instantly claimed process as all of the process steps for preparing the carbohydrate fatty acid esters are taught in the art. Where the steps of a process are the same as the prior art, and the only difference is in the recital of the product produced, the process is unpatentable over the prior art.

Conclusion

2. Claims 1-6 and 8-23 are pending. Claims 1-6, 8-10, 13, and 15-21 are rejected. Claims 11-12, 14, and 22-23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. No claims are allowed.
3. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Contacts

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick T. Lewis whose telephone number is 703-305-4043. The examiner can normally be reached on M-F 8:00 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James O. Wilson can be reached on 703-308-4624. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3014 for regular communications and 703-305-3014 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.

Patrick T. Lewis, PhD
Examiner
Art Unit 1623



James O. Wilson
Supervisory Patent Examiner
Technology Center 1600

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January 11, 2004